IN THE CLAIMS:

Please CANCEL claims 2-24, 26-29 and 31-34, without prejudice or disclaimer, as these claims were withdrawn from consideration.

Please CANCEL claims 1 and 25, without prejudice or disclaimer, and ADD new claims 35 and 36 as follows.

The Applicant originally intended to amend claims 1 and 25 as indicated below. However, due to the use of underlining and strikethrough, it is very difficult to see the equations and subscripts intended to be amended into claims 1 and 25. For this reason, claims 1 and 25 are CANCELED herein. Instead, new claims 35 and 36 are added and correspond, respectively, to canceled claims 1 and 25 as shown with the amendments below. Claims 1 and 25 are shown below for the convenience of the Examiner, so that the differences of new claims 35 and 36 over claims 1 and 25 can easily be seen.

1. (CANCELED) A computerized parallel efficiency calculation method for calculating a parallel efficiency of a parallel computer system executing a specific processing as a whole, said computerized parallel efficiency calculation method comprising ~~the steps of~~:

measuring, in each processor i of said parallel computer system, a processing time $\gamma_i(p)$ of a parallel processing portion within a processing executed in each said processor, and a processing time $\chi_{i,j}(p)$ of each parallel performance impediment factor j within said processing executed in each said processor;

calculating a load balance contribution ratio Rb(p) ~~representing a load balance degree between respective processors included in said parallel computer system~~ according to

$$R_b(p) \equiv \frac{\sum_{i=1}^{p} \tau_i(p)}{\tau(p) \cdot p}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system, wherein

$$\tau_i(p) \equiv \gamma_i(p) + \sum_{j=1}^{j_{Others}} \chi_{i,j}(p)$$

, and

$$\tau(p) \equiv \underset{i=1}{\overset{p}{Max}}(\tau_i(p))$$

;

calculating a virtual parallelization ratio representing a ratio, with respect to time, of a portion processed in parallel by said respective processors ~~among processings~~ executed in said parallel computer system according to

$$R_p(p) \equiv \frac{\sum_{i=1}^{p} \gamma_i(p)}{\tau(1)}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system, wherein $\tau(1)$ is substantially equivalent to a processing time in case where only one processor executes said specific processing;

calculating a parallel performance impediment factor contribution ratio ~~representing a ratio of a processing time of a processing portion corresponding to each parallel performance impediment factor to a total processing time of all said processors included in said parallel computer system~~ according to

$$R_j(p) \equiv \frac{\sum_{i=1}^{p} \chi_{i,j}(p)}{\sum_{i=1}^{p} \tau_i(p)}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system; and

calculating and outputting to an output device, a parallel efficiency by using said load balance contribution ratio, said virtual parallelization ratio, and said parallel performance impediment factor contribution ratio, and

wherein a load balance is not kept among said respective processors included in said parallel computer system.

2. (Cancelled)

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Cancelled)

8. (Cancelled)

9. (Cancelled)

10. (Cancelled)

11. (Cancelled)

12. (Cancelled)

13. (Cancelled)

14. (Cancelled)

15. (Cancelled)

16. (Cancelled)

17. (Cancelled)

18. (Cancelled)

19. (Cancelled)

20. (Cancelled)

21. (Cancelled)

22. (Cancelled)

23. (Cancelled)

24. (Cancelled)

25. (CANCELED) A computer readable storage medium embodying a program ~~embodied on a medium~~ for causing a computer to execute operations ~~calculate~~calculating a parallel efficiency of a parallel computer system, said ~~program~~ operations comprising ~~the steps of~~:

calculating a load balance contribution ratio ~~representing a load balance degree between respective processors included in said parallel computer system~~ according to

$$R_b(p) \equiv \frac{\sum_{i=1}^{p} \tau_i(p)}{\tau(p) \cdot p}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system, wherein

$$\tau_i(p) \equiv \gamma_i(p) + \sum_{j=1}^{j_{Others}} \chi_{i,j}(p)$$

, and

$$\tau(p) \equiv \underset{i=1}{\overset{p}{Max}}(\tau_i(p))$$

;

calculating a virtual parallelization ratio representing a ratio, with respect to time, of a portion processed in parallel by said respective processors ~~among processings~~ executed in said parallel computer system according to

$$R_p(p) \equiv \frac{\sum_{i=1}^{p} \gamma_i(p)}{\tau(1)}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p

of processors of said parallel computer system, wherein $\tau(1)$ is substantially equivalent to a processing time in case where only one processor executes said specific processing;

calculating a parallel performance impediment factor contribution ratio ~~representing a ratio of a processing time of a processing portion corresponding to each parallel performance impediment factor to a total processing time of all said processors included in said parallel computer system~~ according to

$$R_j(p) \equiv \frac{\sum_{i=1}^{p} \chi_{i,j}(p)}{\sum_{i=1}^{p} \tau_i(p)}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system; and

calculating and outputting to an output device, a parallel efficiency by using said load balance contribution ratio, said virtual parallelization ratio, and said parallel performance impediment factor contribution ratio~~.~~, and

wherein a load balance is not kept among said respective processors included in said parallel computer system.

26. (Cancelled)

27. (Cancelled)

28. (Cancelled)

29. (Cancelled)

30. (Currently Amended) A parallel efficiency calculation apparatus for calculating a parallel efficiency of a parallel computer system, comprising:

a first calculator ~~for~~ calculating a load balance contribution ratio ~~representing a load balance degree between respective processors included in said parallel computer system~~;

a second calculator ~~for~~ calculating a virtual parallelization ratio representing a ratio, with respect to time, of a portion processed in parallel by said respective processors ~~among processings~~ executed in said parallel computer system;

a third calculator ~~for~~ calculating a parallel performance impediment factor contribution ratio ~~representing a ratio of a processing time of a processing portion corresponding to each parallel performance impediment factor to a total processing time of all said processors included in said parallel computer system~~; and

a fourth calculator ~~for~~ calculating and outputting to an output device, a parallel efficiency by using said load balance contribution ratio, said virtual parallelization ratio, and said parallel performance impediment factor contribution ratio~~.~~, and

wherein a load balance is not kept among said respective processors included in said parallel computer system.

31. (Cancelled)

32. (Cancelled)

33. (Cancelled)

34. (Cancelled)

35. (New) A computerized parallel efficiency calculation method for calculating a parallel efficiency of a parallel computer system executing a specific processing as a whole, said computerized parallel efficiency calculation method comprising:

measuring, in each processor i of said parallel computer system, a processing time $\gamma_i(p)$ of a parallel processing portion within a processing executed in each said processor, and a processing time $\chi_{i,j}(p)$ of each parallel performance impediment factor j within said processing executed in each said processor;

calculating a load balance contribution ratio Rb(p) according to

$$R_b(p) \equiv \frac{\sum_{i=1}^{p} \tau_i(p)}{\tau(p) \cdot p}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system, wherein

$$\tau_i(p) \equiv \gamma_i(p) + \sum_{j=1}^{j_{Others}} \chi_{i,j}(p)$$, and

$$\tau(p) \equiv \underset{i=1}{\overset{p}{Max}}(\tau_i(p))$$;

calculating a virtual parallelization ratio representing a ratio, with respect to time, of a portion processed in parallel by said respective processors executed in said parallel computer system according to

$$R_p(p) \equiv \frac{\sum_{i=1}^{p} \gamma_i(p)}{\tau(1)}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system, wherein $\tau(1)$ is substantially equivalent to a processing time in case where only one processor executes said specific processing;

calculating a parallel performance impediment factor contribution according to

$$R_j(p) \equiv \frac{\sum_{i=1}^{p} \chi_{i,j}(p)}{\sum_{i=1}^{p} \tau_i(p)}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system; and

calculating and outputting to an output device, a parallel efficiency by using said load balance contribution ratio, said virtual parallelization ratio, and said parallel performance impediment factor contribution ratio, and

wherein a load balance is not kept among said respective processors included in said parallel computer system.

36. (New) A computer readable storage medium embodying a program for causing a computer to execute operations calculating a parallel efficiency of a parallel computer system, said operations comprising:

calculating a load balance contribution ratio according to

$$R_b(p) \equiv \frac{\sum_{i=1}^{p} \tau_i(p)}{\tau(p) \cdot p}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system, wherein

$$\tau_i(p) \equiv \gamma_i(p) + \sum_{j=1}^{j_{Others}} \chi_{i,j}(p)$$

, and

$$\tau(p) \equiv \underset{i=1}{\overset{p}{Max}}(\tau_i(p))$$

;

calculating a virtual parallelization ratio representing a ratio, with respect to time, of a portion processed in parallel by said respective processors executed in said parallel computer system according to

$$R_p(p) \equiv \frac{\sum_{i=1}^{p} \gamma_i(p)}{\tau(1)}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system, wherein $\tau(1)$ is substantially equivalent to a processing time in case where only one processor executes said specific processing;

calculating a parallel performance impediment factor contribution ratio according to

$$R_j(p) \equiv \frac{\sum_{i=1}^{p} \chi_{i,j}(p)}{\sum_{i=1}^{p} \tau_i(p)}$$

by using the measured processing time $\gamma_i(p)$, said processing time $\chi_{i,j}(p)$ and a number p of processors of said parallel computer system; and

calculating and outputting to an output device, a parallel efficiency by using said load balance contribution ratio, said virtual parallelization ratio, and said parallel performance impediment factor contribution ratio, and

wherein a load balance is not kept among said respective processors included in said

parallel computer system.